**Professional Development Situation: Meeting**
**Skill Focus: Giving Youth Control**
**Time Required: 35 minutes**

# TINKERING

Participants will learn how tinkering is important to learning in computer science and prepare to engage youth in directing their learning.

## Agenda

Introduction and welcome – 2 minutes
Explore The Tinkering Studio website – 25 minutes

- Exploratorium's The Tinkering Studio
- Exploratorium's Learning Dimensions of Making and Tinkering

Sharing personal strategies – 8 minutes

## Materials

- Documents/Links:
  - The Tinker Studio: https://www.exploratorium.edu/tinkering
  - Learning Dimensions of Making and Tinkering: https://www.exploratorium.edu/tinkering/our-work/learning-dimensions-making-and-tinkering
  - An Overview of Learning through Making and Tinkering: https://www.exploratorium.edu/sites/default/files/pdfs/brief_OverviewOfLearning.pdf
- For Facilitator:
  - Computer with internet connection and online meeting tool (i.e. Zoom)
- For Participants:
  - Computer with internet connection and online meeting tool (i.e. Zoom)
  - Paper (for taking notes while brainstorming)
  - Pen or pencil

# Before the Session

- Read this meeting guide to become familiar with the content and allow time to personalize the activities to your presentation style. Review the information on tinkering on The Tinkering Studio and Learning Dimensions of Making and Tinkering from the Exploratorium. You will be using information for this session under the "projects," "our work," and "about us" tabs at the top of the page.
    - *Italics indicate text that can be read aloud or emailed to the participants.*
- Develop a list of possible questions or concerns participants might have during the meeting and how you would respond. Review any key terms or ideas that might be unclear.
- Practice with the online meeting tool. Be comfortable using the whiteboard and setting up breakout rooms where the participants can work in small groups.
- Send a reminder about the meeting. Determine if any participants require accommodations (sight, hearing, etc.).
    - *The next professional development opportunity to enhance our computer science skills will be on DATE at TIME. We will be using (online meeting tool, i.e. Zoom). This session will focus on tinkering and how tinkering is important to learning. During the meeting, we will explore the Exploratorium's The Tinkering Studio and the Learning Dimensions of Making and Tinkering. You may want to have paper handy for taking notes. I am happy to answer any questions you have and look forward to our virtual meeting. I can be reached at CONTACT INFO.*

# Session Outline

## Introduction and Welcome (2 min)

- Welcome participants.
- Introduce the focus of this session.
    - *In computer science, it is important that learners are able to tinker. Tinkering can help students learn coding, and computational thinking can help tinkering. Tinkering is a term you may have heard before, but perhaps you have not thought about how to use tinkering when doing computer science activities with youth.*
    - *Research shows that orchestrating programs to help young people build interest, skills, and shared goals can be achieved by encouraging collaboration, sharing amongst young people, and fluid roles between more expert and novice group members. Researchers found that creating flexible pedagogical environments that support a range of group or solo projects, community or social action projects allows*

*for generous and intellectually generative learning environments. (For more information refer to the Overview of Learning through Making and Tinkering research brief.)*

- *Today, we are going to go to a website called The Tinkering Studio to learn about tinkering and why it's important.*

- Share your screen in the meeting tool (e.g. zoom) so everyone can follow along as you navigate the site.

## Explore the Tinkering Studio Website (25 min)

- *I'm going to model tinkering by having you construct your own understanding as I guide you through the tinkering studio's webpage. Let's start with the Learning Dimensions of Making and Tinkering*

- Share the link to the Learning Dimension of Making and Tinkering: https://www.exploratorium.edu/tinkering/our-work/learning-dimensions-making-and-tinkering
  - *After you have looked at the learning dimensions, watch the two videos at the bottom of the webpage. If you have extra time you might want to look at the project guides under the "projects" tab.*
  - *Be prepared to discuss the following questions:*
    - *What learning dimensions do you think would be especially helpful to use in computer science activities? Why?*
    - *Which of the learning dimensions do you think were most clearly demonstrated in Katrina's projects? Why?*
    - *What makes making and tinkering a concept for learning* (answer: potential for deeper learning where youth own their own learning*).*
    - *What is one reason why putting tinkering into your activities would be beneficial to students?*
  - *We will come back together at* _____ (Allow about 10 minutes). *And be ready to share what you've learned.*
- As participants are reviewing the Learning Dimension of Making and Tinkering and viewing the two videos, prepare to divide the group into breakout rooms with 3-4 participants in each room. After 10 minutes, bring the group back together. You may want to have them give you a raised hand or thumbs up signal, so you know everyone has returned.
  - *You may want to come back later and explore some of the other resources on this website. Now, you will work in small groups and brainstorm at least five ways to use*

*tinkering to foster learning in your program. You can include activities you are already doing or new projects from the Tinkering Studio or other sources. Your group will have 9 minutes to discuss and brainstorm. When I give you a one-minute warning, pick one idea to type in the chat box and share with the entire group.*

- *When you get in your small group, introduce yourself by sharing:*
  - *Your name*
  - *One technology you've used today (cell phone, electric toothbrush, microwave, etc.)*
  - *How you used the technology.*
- *For instance, you might say, "My name is Marta and I used my cell phone to wake me up this morning." Keep it brief so you have time for brainstorming.*
- *Are there any questions?* (Resolve questions.)
- *We will come back together at* _____ (share what time it will be 9 minutes from now).

- Send participants to their breakout rooms and give them 9 minutes to work. Click on "Close all Rooms" to give a one-minute warning.
- After all the breakout rooms are closed, ask each group type one idea in the chat box.
- Have participants review the ideas in the chat and look for three things:
  1. *Which idea would work the best for your program?*
  2. *Which idea is the most innovative?*
  3. *Which idea are you the most interested in trying?*

## Sharing Personal Strategies (8 min)

- *Your small group discussion may have given you new ideas for incorporating tinkering into activities you are already doing or some new activities you can try. What ideas do you have for adding tinkering to existing activities in your program? How do you think this will benefit the youth in your program? Take a moment to think about that before we start sharing the strategies we are taking away from today's session.*

- **It is crucial for participants to understand what tinkering is and how it contributes to learning, or they will not see the value in adding it to existing activities or doing activities that involve tinkering.**
- Use one or more of these questions to get a discussion started.
  - *What have you learned through tinkering?*

    - *How do you think preparing for tinkering experiences will be different? What will you need to prepare?*
    - *What other resources could we use to help our program participants tinker with computer science?*
- Depending on the size of the group, it may be easier to turn on microphones and take turns talking; otherwise, have participants type in the chat box. If your group is not too large, invite individuals to participate by saying, "NAME, do you have any ideas?
    - *Thank you for your active participation in this session. Remember, it is up to you to take what you learned today and use it to help the young people you work with. I will download our chat and pull together all the great ideas we discussed today and send them to you along with the link to* The Tinkering Studio *so you have all this information in one email.*

## After the Session

- Before you end the webinar, download the chat. Compile the ideas for using tinkering in their programs in a document to send to participants.
- Email the participants:
    - *Thank you for your participation in the recent Click2Science meeting Tinkering. I hope you found it useful and applicable to your practice. Here are the lists of ideas you brainstormed for incorporating tinkering into your programs. I have also included the link to The Tinkering Studio in case you would like to bookmark it.*
        - https://www.exploratorium.edu/tinkering.

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